

Abstract of the Disclosure

RF magnetic shields which support tangential electric fields. The RF shields are particularly suited for use in magnetic resonance imaging (MRI) systems, but may also be used in other radio frequency applications. The RF magnetic shields may include a dielectric layer having conductive regions separated by non-conductive regions on each side thereof to form a plurality of capacitive elements. The capacitive elements are partially non-conductive at radio frequencies such that the electrical component tangent to the shield is supported and the magnetic component perpendicular to the shield is blocked. The size and shape of the non-conductive and conductive regions are selected to develop a capacitive voltage across the capacitive elements at radio frequencies, and be substantially non-conductive at frequencies other than RF. The RF magnetic shields provide an electrical field that is uniform around the entire sample volume.

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